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Research Article

An Exploratory Study of Facebook Intensity and its links to Narcissism, Stress, and Self-esteem

Adam O'Sullivan* and Zaheer Hussain

Abstract

Facebook use has become a popular social activity. More intensive use of Facebook may increase the risk of health problems. Research suggests that high levels of stress and low levels of self-esteem are linked to Facebook intensity usage, however, these findings have been inconsistent, as studies also suggest the opposite or no links at all. This exploratory study examined whether narcissism, stress and self-esteem could predict Facebook intensity, and whether a short session on Facebook could produce immediate psychological effects. A sample of 163 Facebook users completed an online survey, engaged in a short Facebook session and then completed another online survey. Regression analysis revealed that narcissism, stress and self-esteem were found to significantly predict Facebook intensity with stress being a significant predictor within the model. Facebook use significantly increased self-esteem scores amongst the participants. The findings are discussed in relation to previous research and theory.

Keywords

Facebook; Narcissism; Stress; Self-esteem; Social networking

Introduction

The availability of the internet, and the devices in which to access it (e.g., gaming consoles, smartphones, and tablets) have grown rapidly in the last decade, more and more people are engaging in online activities. In 1995, less than 1% of the world population had internet access, since then, this figure has increased tenfold equating to more than three billion internet users worldwide [1-3]. Statistics for internet access in Great Britain [4] show figures for adult internet users accessing the internet every or almost every day has more than doubled since 2006, from 16.2 million to 39.3 million, equating to 78% of the adult population. Furthermore, 61% of adults use some form of social networking site (SNS) and 79% of these do so every, or almost every day [4]. Despite the minimum age restriction of thirteen (age restrictions vary between different SNS) for creating and using a social networking account [5] more than half of children have used a SNS by the age of ten [6] with Facebook being the most popular; 52% of eight to sixteen year olds admitted they ignored the official

age limit when creating an account. Given these statistics, it is not only important for internet users to be aware of the dangers they face online (such as cyberbullying), but it is also a vital area to investigate with regards to mental health as research suggests the use of SNS can have an impact on one's well-being [7].

The rise of SNS has altered the way people communicate and how individuals present themselves [8]. Founded in 2004, Facebook is the most popular SNS [9] that can be accessed through multiple devices, including PCs, tablets, gaming consoles and mobile phones. Since December 2015, Facebook has reported 1.04 billion daily active users and 1.59 billion monthly active users worldwide [10]. In addition to this, Facebook also reports 934 million mobile daily active users and 1.44 billion mobile monthly users, giving users access to the site wherever they are. Facebook's goal is to give people the power to share and make the world more connected, this is done by creating an online profile, sending messages, finding other Facebook users and sharing videos, pictures and status updates anywhere in the world. Whilst the idea of 'being connected' appears to be advantageous, for example, viral posts can help track down owners of lost property [11] and people [12], it is also used as a way of communication and to promote terrorism [13] and bullying [14], therefore it is important for psychologists to investigate how Facebook usage can vary between individuals and personality types.

The internet is often used by those experiencing health-related stress and problems and to seek health-related information in order to understand their symptoms and treatments [15]. Facebook is often used for seeking social support and research has shown that if the support was perceived in adolescents, this decreased their depressed moods, however, if not perceived, this had adverse effects and increased their depressed moods [1]. Nabi et al. [16] found the number of Facebook friends to be a strong predictor of perceived social support. This suggests that the use of a Facebook account, with the idea of having many friends can help reduce stress and physical illness thus providing greater well-being for an individual. However, Tiemensma et al. [17] study contradicts this as it was found those assigned to a Facebook user group after experiencing acute social stress showed an impaired recovery with regard to salivary cortisol and feelings of anxiety and tension compared to those who did not use Facebook (control group). Due to the controlled design and small sample size (40 participants, as this was a pilot study) this study cannot be generalised, thus further research is required. The amount of time spent on Facebook and a number of social network memberships has been found to relate to stress; the more time and more memberships were linked to higher stress in adult Facebook users aged 18-70 [18]. Users who shared important, bad health news on Facebook were found to have higher stress than those who did not, however, it was also found that those who did not share important information also reported greater stress. These inconsistent findings could be due to the nature of the content shared, indicating a need for further research in this area.

Previous research has highlighted a relationship between self-esteem and Problematic Internet Use (PIU); lower self-esteem scores correlate with higher PIU [19]. Those who reported higher PIU mainly participated in online forums, online gaming and chatting. Although this study does not relate directly to Facebook, findings

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can be generalised as Facebook offers users the ability to do all the aforementioned activities on its site. Similarly, Blachnio et al. [2] found statistical differences between ordinary Facebook users and both addicted and intensive users, where low self-esteem and life satisfaction related to increased Facebook use and addiction. This suggests that those with low self-esteem resort to increased Facebook use as a strategy to cope and to enhance their mood. Wilcox et al. [20] found this to be the case; when users browsed their close friends on SNS, self-esteem was momentarily increased, however, this also reduced self-control in the individual, suggesting social network use is associated with a higher body mass index and higher levels of credit card debt. According to the Social Comparison Theory [21] SNS, such as Facebook, give off the impression that others are doing better than oneself, leading to negative social comparisons which are detrimental to perceptions about the self. De Vries et al. [21] found Facebook use was related to a greater degree of negative social comparison, which is negatively related to self-perception and self-esteem. The relationship between Facebook use and negative social comparison was stronger in unhappy individuals when compared to happier individuals, suggesting those with low levels of self-perception and self-esteem are prone to more intense Facebook use. This claim can be seen as controversial, as research investigating the links between Facebook use and self-esteem appear to conflict and contradict one another. In contrast to previous research, Lee [22] found personality traits such as; racial identity, trust in people, satisfaction with university life and self-esteem were not significant predictors for the amount of time spent on Facebook in African American college students. This differs from the work of Hong et al. [23] who found that self-inferiority can significantly predict Facebook usage in Taiwanese university students, suggesting cultural differences could account for the variation in results, therefore more research into the links between self-esteem and Facebook usage is required.

Facebook is not anonymous as it requires users to create an online profile representing themselves, therefore anything they post, say or use on the site can be traced directly back to them. This creates a field of interest for Psychologists to investigate how an individual's personality type may affect and influence how they use Facebook, for example, individuals with narcissistic tendencies have been found to post more negatively valenced content [24]. Narcissism is described as an "individual differences, personality construct with the primary characteristic of an excessive love or admiration of oneself or grandiose and inflated sense of self" [25]. große Deters et al. [26] found SNS users believe narcissism to be a strong predictor of status updating activity, however, results from a German and US sample yielded null-results when testing for the effect of narcissism on status updating activity. Being narcissistic on Facebook, a website that allows and encourages users to self-promote (via status updates and picture uploads), is seen as a negative thing. Users high in narcissism are less likely to receive 'comments' and 'likes' from their Facebook friends compared to users low in narcissism [27].

Narcissism in social media has been associated with negative peer appraisals [28] and users who post narcissistic status updates are perceived as less likable and less worthy of friendship. Textual and visual personal information disclosure are more frequent with narcissistic Facebook users [29] and online activity has been found to be greater amongst non-narcissistic users [30], however, Davenport et al. [31] contradict this, as they found there was no relationship between active Facebook usage and narcissism in a US college sample. This supports previous research [32] that found narcissists in the millennial generation (reaching young adulthood around the

year 2000) did not use SNS any more than non-narcissists, but their motive for using it was different, such as having as many SNS friends as possible, believing their SNS friends were interested in what they were doing and having their profile project a positive image. Pearson et al. [33] found that high narcissism scores were linked to smartphone addiction. Their results also revealed that 13.3% of smartphone users were classed as addicted and 87% of the sample reported using SNS applications most frequently, some described Facebook as 'addictive' and stated logging in to Facebook was the first thing they did in the morning, and the last thing they did at night. This suggests the addiction may not necessarily be to the smartphone itself, but more to the Facebook application, the device is merely a convenient gateway to access it, therefore further research is imperative.

Intensive Facebook use has been linked to detrimental effects on mental health such as disordered eating behaviour [34] and depression [35] as well as being linked to isolation, skipping meals, headaches and eye irritation [36]. It is important for Psychologists to identify factors that may predict excessive Facebook use in order to prevent the possible development of negative health effects. Blachnio et al. [37] found low levels of self-esteem and high levels of narcissism can be predictors of Facebook use in Poland. Labrague [38] found that the intensity of Facebook use is not directly related to negative emotional states, however, time spent on Facebook did increase depression, anxiety and stress scores in college students.

Previous research has predominately investigated narcissism, self-esteem and stress as predictors for Facebook usage as standalone measures. However, no research has investigated the possibility of all three measures combined being predictors of Facebook usage. The current study set out to fill this gap by investigating how narcissism, stress and self-esteem affect Facebook intensity usage.

The main aim of this exploratory study was to discover whether narcissism, stress, and self-esteem can predict Facebook usage (h_1). It was hypothesised that high levels of narcissism, high levels of stress and low levels of self-esteem will individually be linked to more intensive use of Facebook (h_2). The study also sets out to investigate whether a short Facebook session would lead to an immediate effect on narcissism, stress and self-esteem by comparing before and after (Facebook session) scores. It was predicted that there would be a decrease in narcissism scores after the Facebook session (h_3). It was also predicted that lower stress scores will be reported after the Facebook session, compared to stress scores before the session (h_4). Finally, it was also predicted that self-esteem scores will be higher after a Facebook session, compared to scores reported before the session (h_5).

Methods

Design

An online survey design was utilised in the current study. The variables under investigation were Facebook Intensity Scale scores, Narcissistic Personality Inventory scores, Perceived Stress Scale scores, and Self-Esteem Scale scores.

Participants

A total of 190 participants were recruited using opportunity sampling. Out of those 190, 27 participants failed to complete all questionnaires, leaving a final sample of 163 with complete data that was analysed. The sample consisted of 43 males (26.4%) and 120 females (73.6%), the majority of participants were aged between 18-

24 years (n=145, 89%). Other age categories included 25-40 year olds (n=14, 8.6%) and 40+ years (n=4, 2.4%).

Materials

Data for both studies were obtained using an online survey of Facebook intensity usage and using standardised measures of narcissism, stress and self-esteem. Online survey software, *Qualtrics*, was used to construct and administer the online survey. The survey consisted of the Facebook Intensity Scale [39], the Narcissistic Personality Inventory [40], the Perceived Stress Scale [41] and the Rosenberg Self-Esteem Scale [42].

The Facebook Intensity Scale [39] is used to measure Facebook usage beyond the simple measures of frequency and duration. Consisting of 8 items which are presented on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Scores were attained by calculating the mean of all of the items in the scale, with a minimum score of 1, and a maximum score of 6.25. This scale has been shown to have good reliability in previous research [43], reporting Cronbach's Alpha value at .83.

The Narcissistic Personality Inventory [40] consists of 40 pairs of statements which belong to seven sub-sections. Each sub-section is a known trait of narcissism. These are authority, self-sufficiency, superiority, exhibitionism, vanity, exploitativeness and entitlement. Each statement belongs to either column A or column B. Statements from column A are typically narcissistic and score one point. For example, 'I would prefer to be a leader'. Statements from column B are not typically narcissistic and therefore are not worth any points. For example, 'It makes little difference to me whether I am a leader or not'. Scores are obtained by totalling up responses with a minimum score of 0 and a maximum score of 40. This scale has shown an alternate form reliability of .72, and evidence of good construct validity [40].

The Perceived Stress Scale [41] consists of 10 items with Likert scale responses ranging from 0 (never) to 4 (very often), to assess an individual's stress levels within the last month. Scores are obtained by reversing responses to the four positively stated items, and then summing across all scale items, giving a minimum score of 0, and a maximum score of 40. The PSS has high internal reliability, and has shown to report Cronbach's alpha consistently upwards of .82 [44,45].

The Rosenberg Self-Esteem Scale [41] is a 10 item scale with Likert scale responses ranging from 0 (strongly disagree) to 3 (strongly agree). Participants respond to statements dealing with general feelings about themselves (e.g., *I take a positive attitude towards myself, On the whole, I am satisfied with myself*). Scores are obtained by reversing 5 of the negatively stated items, and summing the scores for all 10 items. Scores range from 0 to 30, the higher the scores, the higher the self-esteem. Cronbach's alpha score for RSES has been reported as 0.8 [46] showing high internal reliability.

Procedure

Recruitment of participants was conducted via an online research participation scheme at a well-known UK university and via online posts on Facebook. A link to the online survey was posted on these websites. It was a requirement for participants to already have an active Facebook account that was accessible during the study. Participants were not limited as to what device they could access Facebook on (PC, tablet, smartphone). After clicking the link to the survey, participants were presented with the invitation to participate in the study. The invitation gave a brief description of the study, its aims and why it was being carried out as well as a contact method for

the researcher, in case the participant had any queries that had not been answered. Participants were informed that in order to take part an active Facebook account which was accessible during the study was needed. Participants were also informed of their right to withdraw at any point during the study and up to two weeks after taking part. Participants were ensured their data would be stored on a password protected computer and would remain confidential.

After giving consent to take part in the study the participants were presented with the FBI scale, followed by the NPI, then the PSS and then the RSES. After completing these scales, the participant was asked to login to their Facebook account and begin browsing as they normally would, for a total of five minutes (a 5-minute countdown appeared on their screen). After their Facebook session, participants were asked brief questions regarding their age, gender and general Facebook use. Participants were then presented with the 3 of the earlier scales, but this time in reverse order; RSES followed by PSS and ending with the NPI. After completion of the scales, participants were debriefed and thanked for their participation. Participants recruited via the University's research participation scheme were allocated 2 research points for taking part.

Results

Predictors of Facebook intensity

A Multiple Regression Analysis using the Enter Method was used to discover whether narcissism, stress, and self-esteem can predict Facebook usage (H_1). The regression equation produced a small to moderate effect size ($R^2=.082$, Adjusted $R^2=.065$) indicating that 6.5% of the variance in Facebook intensity usage scores in the general population could be explained by the model. The regression equation also indicated that the variables of narcissism, stress and self-esteem were significant predictors of Facebook intensity usage ($F(3, 159)=4.753, p=.003$). A Durbin-Watson statistic of .507 suggested a positive correlation between two or more of the predictors entered, however, variance inflation factors ranged from 1.148 to 1.831 between the predictors, indicating that multi-collinearity was not a cause for concern.

There was a significant positive relationship between perceived stress scores and Facebook intensity usage ($t=3.398, df=162, p=.001$), with the model predicting that one unit change in perceived stress score would result in an increase of .046 Facebook intensity score. Narcissism ($t=1.556, df=162, p=.122$) and self-esteem ($t=1.945, df=162, p=.054$) were not found to be significant predictors of Facebook intensity usage. The results indicated that the higher perceived stress a person is subjected to, the more intense their use of Facebook is [Table 1](#).

A correlational design was used to test the hypothesis that higher narcissism and stress scores and lower self-esteem scores would individually be linked to Facebook intensity usage (H_2) the outcome variable was screened for normal distribution. Facebook intensity usage was found to be normally distributed ($Z_{skew}=.26, Z_{kurtosis}=-1.3$). Correlations between the variables are shown in [Table 2](#).

There was a statistically significant positive correlation between narcissism scores ($mean=10.86, S.D=6.36$) and self-esteem scores ($mean=17.85, S.D=5.03$), $r=.359, p < .001, R^2=.129$. There was a statistically significant negative correlation between narcissism scores and stress scores ($mean=20.34, S.D=6.23$), $r=-.222, p=.002, R^2=.049$. There was a statistically significant negative correlation between stress scores and self-esteem scores ($mean=17.85, S.D=5.03$), $r=-.635, p <$

Table 1: Multiple regression analysis of factors influencing Facebook Intensity.

Variable	B	Std. error	Beta	t	p
Narcissism	.017	.011	.127	1.556	.122
Stress	.046	.014	.334	3.398	.001
Self-esteem	.034	.018	.200	1.945	.054

Note: ($F(3, 159) = 4.753, p = .003, R^2 = .082, Adjusted R^2 = .065$) $p < .05$

Table 2: Correlation coefficients (and significance levels) for the predictors Narcissism, Stress and Self-Esteem and the outcome variable, Facebook Intensity.

	Narcissism score	Stress score	Self-esteem score
Facebook intensity score	.124 (.057)	.179 (.011)	.033 (.338)
Narcissism score		-.222 (.002)	.359 (<.001)
Stress score			-.635 (<.001)

.001, $R^2 = .404$.

The effects of a facebook session

In order to test the hypotheses that a Facebook session would decrease narcissism scores (H_3), stress scores (H_4) and increase self-esteem scores (H_5) variables were screened for normal distribution. Parametric assumptions were violated, due to some of the variables being outside the appropriate Z score range therefore the non-parametric equivalent of the Paired-Sample T-Test was used, that being the Wilcoxon Signed-Rank Test.

There was a decrease in narcissism scores from the initial scores reported ($mean=10.86, S.D=6.36$) to the scores reported after the Facebook session ($mean=10.63, S.D=6.77$) however this difference was not found to be significant ($Z=-1.41, p=.158$). Similarly, results indicated a decrease in stress scores from the initial scores reported ($mean=20.34, S.D=6.23$) to the scores reported after the Facebook session ($mean=20.19, S.D=6.19$) but this was also not significant ($Z=-.75, p=.453$). An increase in self-esteem scores was found, from the initial scores reported ($mean=17.85, S.D=5.03$) to the scores reported after the Facebook session ($mean=18.63, S.D=5.03$) this was found to be significant ($Z=-4.436, p < .001$), with a small to medium effect size ($r=-.25$).

Discussion

The main objectives of the present study were to discover whether narcissism, stress, and self-esteem are linked to Facebook usage and to investigate whether a short Facebook session would lead to an immediate effect on narcissism, stress and self-esteem by comparing before and after Facebook session scores. The hypothesis that narcissism, stress and self-esteem could predict Facebook intensity usage was supported in this study. The combined effect of narcissism, stress and self-esteem were found to significantly predict Facebook intensity usage, however, only stress was indicated to be a significant predictor within the model, suggesting the higher levels of perceived stress a person is subjected to, the more intense their use of Facebook is. Facebook use was not found to be significantly linked to any of the predictors; narcissism, stress or self-esteem, alone. Narcissism was found to possess links with stress, showing a weak but statistically significant negative correlation, and links to self-esteem, showing a slightly stronger, statistically significant positive correlation. The strongest relationship between predictors was the relationship between stress and self-esteem, where a moderate, statistically

significant, negative correlation was found. Although the average narcissism scores and stress scores were both reported to decrease after a five minute Facebook session, these changes were not found to have statistical significance. Self-esteem scores after the Facebook session were found to have increased on average compared to scores before the Facebook session with statistical significance, suggesting a five minute Facebook session can immediately result in increased levels of self-esteem therefore this hypothesis was supported.

The current study supports previous research [2] that high narcissism and low self-esteem [21] can predict Facebook intensity usage, however, only with the inclusion of a stress criteria, in which, high levels of stress was also required in order to predict an increase in Facebook intensity usage. Narcissism alone may not have predicted an outcome in Facebook intensity usage due to the user's motives for using Facebook [32]. These findings support Davenport et al. [31] suggesting narcissism is not directly related to Facebook use. Another possible reason for these results may be explained by social desirability bias. Social desirability bias is defined as participants not truthfully answering questions so to be seen in a positive light [47] and as previously mentioned, narcissistic tendencies online are perceived as a negative thing [8,28] therefore participants may not have answered the questions to the NPI as a true reflection to what they actually believe, affecting the validity of results. Self-esteem alone was also not found to be a significant predictor in Facebook usage. These findings contradict previous suggestions that self-esteem is related to an increase in internet use [19] increased Facebook use [23] and addiction [2] and supports Lee [22] who found self-esteem not to be a predictor for the amount of time spent on Facebook. Stress was found to be the only significant predictor for Facebook usage, in which higher levels of perceived stress predicted higher levels of Facebook intensity usage. This is in line with previous research that found Facebook to be used by individuals seeking social support [1] and that social support could be predicted by the number of Facebook friends [16]. Therefore, the higher the levels of perceived stress in an individual resulted in an increased use of Facebook to find social support, which means an increased number of Facebook friends for the person seeking support, and as Facebook friends is a measure on the Facebook Intensity Scale, this produces higher Facebook intensity usage scores.

The study results showed a significant increase in self-esteem scores reported after a five minute Facebook session, compared to scores before. This supports previous research [20] that found users who browsed their close friends on social networking sites would display a momentary increase in self-esteem, however, the current study did not obtain data on users' Facebook behaviour, so it is difficult to pinpoint exactly what caused this change in self-esteem. Further research within this area, using qualitative methods could prove useful in providing an insight into what specific Facebook behaviours may account for this change [48].

Although the current study produced results suggesting a five minute Facebook session could reduce narcissism and stress scores, the findings were not statistically significant. The hypothesis that narcissism scores would be reduced after a Facebook session was influenced by research that showed that Facebook gives the impression that others are doing better than oneself [20], therefore it was predicted that this would alter and decrease a person's narcissistic views of their self. Similarly, Facebook has been found to decrease an individual's perceived stress [20], so it was interesting that these two traits did not produce significant results. It is possible that individual differences within the study sample may have an effect on the results,

therefore the first step in future research would be to recruit a more diverse sample of Facebook users which will consequently improve the generalisability of the results.

This study is not without its limitations, data gathered for this study relied heavily upon self-report methods which can have an impact on the implications of the findings due to issues of validity. As previously mentioned, social desirability bias may have influenced participant responses, but this can be an issue in many studies. The study sample was of a moderate size but could have been larger given that online recruitment methods were used. Future research should attempt to recruit a larger sample. It is worth noting that although the participants were recruited via opportunity sampling, many of the participants were university students who may have had heightened stress due to their studies. This may have affected their recorded stress scores in the study. Future research could conduct multiple studies at different intervals throughout the year, to investigate how much of an impact this has on stress scores [49]. The majority of participants were recruited via Facebook, this could also affect the validity of results, as it was unknown how long the participants were using Facebook prior to taking part in the study, making it difficult to interpret the differences in scores as being a direct cause of Facebook use. It is possible that a five minute Facebook session may be too short a time period to observe immediate psychological changes in participants' responses. Further longitudinal research using both quantitative and qualitative methods would provide in-depth information about factors contributing to Facebook use.

Conclusion

Facebook and other SNS are now important mediums of online communication, they are used on a daily basis by millions of people worldwide. The present exploratory study has shown that narcissism, stress and self-esteem are significant predictors of Facebook intensity usage and that a short Facebook session can increase self-esteem. However, Facebook use does not cause an immediate change in narcissism or stress. These findings add to the growing social networking research literature and could be useful to health practitioners, social policy advisors, parents and teachers. The findings could help in the development of prevention programmes for those users who experience problems with their SNS use.

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